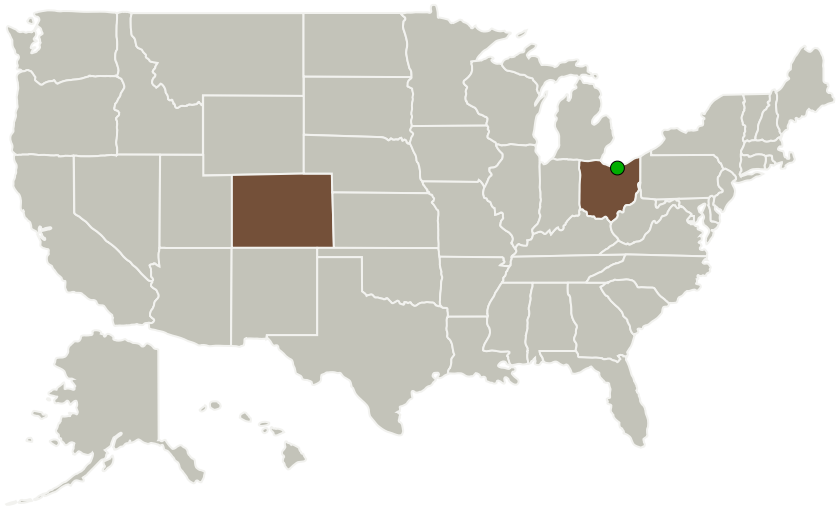
# Advanced Portable Fine Water Mist Fire Extinguisher for Spacecraft, Phase II

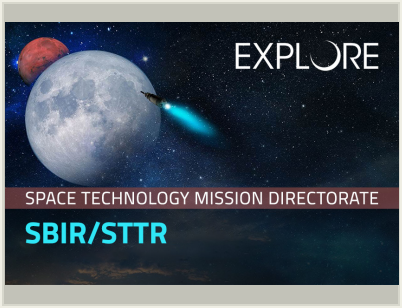
Completed Technology Project (2010 - 2012)

## Project Introduction

Fine water mist (FWM) is a promising replacement technology for fire suppression on the next generation of manned spacecraft. It offers advantages in performance, ease of cleanup, compatibility with on-board environmental systems, and ability to recharge during a mission. ADA Technologies has designed and built a prototype hand-held extinguisher that successfully extinguished test fires in an atmosphere of 34% oxygen and 8 psia total pressure, representing manned spacecraft environments. In this Phase II SBIR project ADA proposes to advance this FWM prototype toward production status by incorporating design improvements compatible with space-based operation and validating the new configuration in fire tests in the spacecraft environment chamber (34% O2 & 8 psia) operated by team member Colorado School of Mines. We will also plan for microgravity (aircraft) testing and prepare a Flight Qualification Test Plan to be used to estimate costs for flight qualification of the hardware. Finally, the production prototype will be tested against UL standard 711 class 2B and 5B flammable liquid fires. A comprehensive specification and drawing package will be prepared. All Phase II project activities will be directed toward advancing the TRL of the technology to Level 8. In Phase II we have added a partner experienced in the production and qualification of flight test fixtures and experiments. ADA has also initiated discussions with a NASA contractor for spacecraft as well as with a commercial supplier of fire protection equipment to take this technology into the broader commercial marketplace, targeting aerospace and flammable fuels storage as early market segments.

## Primary U.S. Work Locations and Key Partners



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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ADA Technologies, Inc. | Lead Organization | Industry | Littleton, Colorado |
| Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |

| Primary U.S. Work Locations | |
|---|---|
| Colorado | Ohio |

## Project Transitions

**February 2010:** Project Start

**September 2012:** Closed out

**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/138792)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

ADA Technologies, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

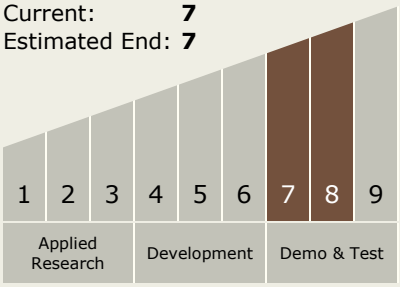
Carlos Torrez

**Principal Investigator:**

James R Butz

## Technology Maturity (TRL)

Start: **8**
Current: **7**
Estimated End: **7**



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## Technology Areas

**Primary:**

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.4 Environmental Monitoring, Safety, and Emergency Response
    - TX06.4.2 Fire: Detection, Suppression, and Recovery

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System